

WHAT IS CLAIMED IS:

1. A refrigerant cycle apparatus comprising: a refrigerant circuit constituted by successively connecting a compressor, a gas cooler, throttling means, and an evaporator,

wherein the throttling means includes a plurality of capillary tubes, refrigerant circulation into each capillary tube is controlled so that a flow path resistance of the throttling means is variable, and the flow path resistance of the throttling means at the time of the starting of the compressor is reduced.

2. The refrigerant cycle apparatus according to claim 1, wherein the throttling means comprises: a first capillary tube; and a second capillary tube which is connected in parallel to the first capillary tube and whose flow path resistance is smaller than that of the first capillary tube, a valve device for controlling the refrigerant circulation into each capillary tube is disposed, and the refrigerant is passed into the second capillary tube at the starting time of the compressor.

3. The refrigerant cycle apparatus according to claim 1, wherein the throttling means comprises: a first capillary tube; and a second capillary tube which is connected in parallel to the first capillary tube and whose flow path resistance is smaller than that of the first

capillary tube, a valve device for controlling the refrigerant circulation into the second capillary tube is disposed, and the refrigerant is passed into the second capillary tube at the starting time of the compressor.

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4. The refrigerant cycle apparatus according to claim 1, 2, or 3, wherein the flow path resistance of the throttling means is reduced or the refrigerant is passed into the second capillary tube for a predetermined time from the starting of the compressor.

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5. The refrigerant cycle apparatus according to claim 1, 2, or 3, wherein the flow path resistance of the throttling means is reduced or the refrigerant is passed into the second capillary tube from when the compressor is started until a temperature of a refrigerant in the refrigerant circuit reaches a predetermined value.

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6. The refrigerant cycle apparatus according to claim 1, 2, or 3, wherein the flow path resistance of the throttling means is reduced or the refrigerant is passed into the second capillary tube from when the compressor is started until a temperature of a space to be cooled by the evaporator drops to a predetermined value.

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7. The refrigerant cycle apparatus according to claim 1, 2, 3, 4, 5, or 6, wherein carbon dioxide is used

as the refrigerant, the compressor includes first and second compression elements driven by a driving element, the refrigerant is sucked into the first compression element from the low-pressure side of the refrigerant circuit and compressed, and the refrigerant discharged from the first compression element and having an intermediate pressure is sucked into the second compression element, compressed, and discharged to a gas cooler.

8. A refrigerant cycle apparatus comprising: a refrigerant circuit constituted by successively connecting a compressor, the apparatus further comprising:

the throttling means including a plurality of capillary tubes; and a control device for controlling refrigerant circulation into each capillary tube and a rotation number of the compressor.

wherein the control device controls the refrigerant circulation so that a flow path resistance of the throttling means is variable, and

the control device reduces the flow path resistance of the throttling means to raise the rotation number of the compressor, when a temperature detected by a sensor is not less than a predetermined value, and increases the flow path resistance of the throttling means to lower the rotation number of the compressor, when the temperature drops from a set value based on an output of the sensor for detecting the temperature of a space to be

cooled by the evaporator.

9. The refrigerant cycle apparatus according to claim 8, wherein the throttling means comprises: a first  
5 capillary tube; and a second capillary tube which is connected in parallel to the first capillary tube and whose flow path resistance is smaller than that of the first capillary tube, the control device is connected to a valve device for controlling the refrigerant circulation into  
10 each capillary tube, and the control device controls the valve device so as to pass the refrigerant into the second capillary tube, when the temperature detected by the sensor is not less than the predetermined value and to pass the refrigerant into the first capillary tube, when the  
15 temperature drops below the set value.

10. The refrigerant cycle apparatus according to claim 8, wherein the throttling means comprises: a first  
20 capillary tube; and a second capillary tube which is connected in parallel to the first capillary tube and whose flow path resistance is smaller than that of the first capillary tube, the control device is connected to a valve device for controlling the refrigerant circulation into the second capillary tube, and the control device controls the  
25 valve device so as to pass the refrigerant into the second capillary tube, when the temperature detected by the sensor is not less than the predetermined value and to pass the

refrigerant into the first capillary tube, when the temperature drops below the set value.

11. The refrigerant cycle apparatus according to  
5 claim 8, 9, or 10, wherein carbon dioxide is used as the refrigerant, the compressor includes first and second compression elements driven by a driving element, the refrigerant is sucked into the first compression element from the low-pressure side of the refrigerant circuit and  
10 compressed, and the refrigerant discharged from the first compression element and having an intermediate pressure is sucked into the second compression element, compressed, and discharged to the gas cooler.

12. A refrigerant cycle apparatus comprising:  
a refrigerant circuit constituted by successively connecting a compressor, a gas cooler, throttling means, and an evaporator; and  
a control device for controlling a flow path  
20 resistance of the throttling means and a rotation number of the compressor,

wherein the control device reduces the flow path resistance of the throttling means to raise the rotation number of the compressor, when a temperature detected by a  
25 sensor is not less than a defined temperature at any of +29°C to +35°C, and increases the flow path resistance of the throttling means to lower the rotation number of the

compressor, when the temperature detected by the sensor is lower than the defined temperature based on an output of the sensor for detecting the temperature of a space to be cooled by the evaporator.

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13. A refrigerant cycle apparatus comprising:

a refrigerant circuit constituted by successively connecting a compressor, a gas cooler, throttling means, and an evaporator;

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a control device for controlling a flow path resistance of the throttling means and a rotation number of the compressor; and

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an internal heat exchanger for exchanging heat between a refrigerant discharged from the gas cooler and a refrigerant discharged from the evaporator,

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wherein the control device reduces the flow path resistance of the throttling means to raise the rotation number of the compressor, when a temperature detected by a sensor is not less than a defined temperature at any of +29°C to +35°C, and increases the flow path resistance of the throttling means to lower the rotation number of the compressor, when the temperature detected by the sensor is lower than the defined temperature based on an output of the sensor for detecting the temperature of the refrigerant discharged from the internal heat exchanger via the

25 evaporator.

14. The refrigerant cycle apparatus according to claim 12 or 13, wherein the temperature of a space to be cooled by the evaporator is set in a range of  $-2^{\circ}\text{C}$  to  $+7^{\circ}\text{C}$ .

5           15. The refrigerant cycle apparatus according to claim 12, 13, or 14, wherein the throttling means comprises: a first capillary tube; and a second capillary tube which is connected in parallel to the first capillary tube and whose flow path resistance is smaller than that of  
10 the first capillary tube, the control device is connected to a valve device for controlling the refrigerant circulation into each capillary tube, and the control device controls the valve device so as to pass the refrigerant into the second capillary tube, when the  
15 temperature detected by the sensor is not less than the defined temperature, and to pass the refrigerant into the first capillary tube, when the temperature is lower than the defined temperature.

20           16. The refrigerant cycle apparatus according to claim 12, 13, or 14, wherein the throttling means comprises: a first capillary tube; and a second capillary tube which is connected in parallel to the first capillary tube and whose flow path resistance is smaller than that of  
25 the first capillary tube, the control device is connected to a valve device for controlling the refrigerant circulation into the second capillary tube, and the control

device controls the valve device so as to pass the refrigerant into the second capillary tube, when the temperature detected by the sensor is not less than the defined temperature, and to pass the refrigerant into the first capillary tube, when the temperature is lower than the defined temperature.

17. The refrigerant cycle apparatus according to claim 12, 13, 14, 15, or 16, wherein carbon dioxide is used as the refrigerant, the compressor includes first and second compression elements driven by a driving element, the refrigerant is sucked into the first compression element from the low-pressure side of the refrigerant circuit and compressed, and the refrigerant discharged from the first compression element and having an intermediate pressure is sucked into the second compression element, compressed, and discharged to the gas cooler.

18. A refrigerant cycle apparatus comprising: a refrigerant circuit constituted by successively connecting a compressor, a gas cooler, throttling means, and an evaporator,

wherein throttling means includes a plurality of capillary tubes, refrigerant circulation into each capillary tube is controlled so that a flow path resistance of the throttling means is variable, and the flow path resistance of the throttling means is increased at the time



of the starting of the compressor.

19. The refrigerant cycle apparatus according to claim 18, wherein the throttling means comprises: a first  
5 capillary tube; and a second capillary tube which is connected in parallel to the first capillary tube and whose flow path resistance is smaller than that of the first capillary tube, a valve device for controlling the refrigerant circulation into each capillary tube is  
10 disposed, and the refrigerant is passed into the first capillary tube at the starting time of the compressor.

20. The refrigerant cycle apparatus according to claim 18, wherein the throttling means comprises: a first  
15 capillary tube; and a second capillary tube which is connected in parallel to the first capillary tube and whose flow path resistance is smaller than that of the first capillary tube, a valve device for controlling the refrigerant circulation into the second capillary tube is  
20 disposed, and the refrigerant is passed into the first capillary tube at the starting time of the compressor.

21. The refrigerant cycle apparatus according to claim 18, 19, or 20, wherein the flow path resistance of  
25 the throttling means is increased or the refrigerant is passed into the first capillary tube for a predetermined time after the starting of the compressor.

22. The refrigerant cycle apparatus according to claim 18, 19, or 20, wherein the flow path resistance of the throttling means is increased or the refrigerant is  
5 passed into the first capillary tube from when the compressor is started until a temperature of the refrigerant in the refrigerant circuit reaches a predetermined value.

10 23. The refrigerant cycle apparatus according to claim 18, 19, or 20, wherein the flow path resistance of the throttling means is increased or the refrigerant is passed into the first capillary tube from when the compressor is started until a temperature of a space to be  
15 cooled by the evaporator drops to a predetermined value.

24. The refrigerant cycle apparatus according to claim 18, 19, 20, 21, 22, or 23, wherein carbon dioxide is used as the refrigerant, the compressor includes first and  
20 second compression elements driven by a driving element, the refrigerant is sucked into the first compression element from the low-pressure side of the refrigerant circuit and compressed, and the refrigerant discharged from the first compression element and having an intermediate  
25 pressure is sucked into the second compression element, compressed, and discharged to the gas cooler.